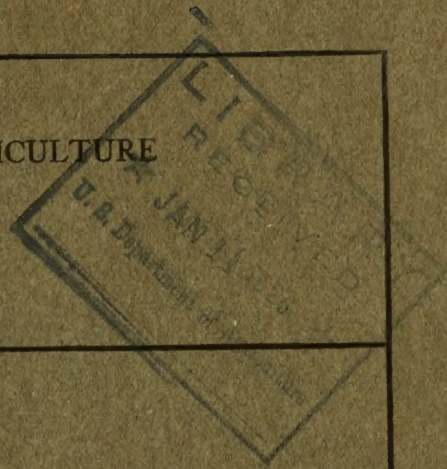


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UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE



MONTHLY REPORT OF THE OFFICES OF
FOREST EXPERIMENT STATIONS AND DENDROLOGY

NOV 1926



MONTHLY REPORT

OFFICES OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

November, 1925

FOREWORD

(Extract from H. A. Watt, "The Composition of Technical Papers").

Getting the Reader's Point of View

Writing is a process of transferring to others by means of visible symbols ideas which exist originally in our own minds. It is one means of expression, of transmission of thought. Speech, which is another means of expression, is at best an imperfect medium for conveying ideas; and writing, deficient in those auxiliary devices of intonation, facial expression, and gesticulation which speech possesses, is even more imperfect. The ideas of the average man are very likely to be badly jumbled; his brain has a curiously perverse trick of skipping from one detail of a subject to another in a most irregular manner, and only the most strenuous efforts at mental concentration will bring order out of chaos. But even when the writer has finally succeeded in getting his mind to thinking clearly and connectedly, he has made only the initial step; there still remains the writing, the translation of the ideas into the written symbols which are to stand for them. And here a thousand pitfalls yawn for him. He may carelessly separate ideas which belong together; he may over-emphasize an unimportant idea by giving it too important a form or too emphatic a position, or he may under-emphasize a really important thought by subordinating it in construction or in position; he may select a word which does not at all convey the idea which he intended it to carry; he may even by an incorrect construction obscure the meaning of his idea entirely or in some cases give a thought exactly the opposite of that which he had in mind. A knowledge of the errors in expression which result in the reader's misunderstanding, and then constant vigilance in guarding against these errors is the price of clear, effective writing.

The most fundamental cause of failure in writing is the inability of the writer to realize the absolute dependence of the reader for his understanding of the ideas to be conveyed upon the written expression of those ideas. Most writers are too self-conscious; they forget that they are writing not for themselves but for other persons. They forget

that if the reader knew as much about the subject as they do, they need not write at all. It may happen, to be sure, that their reader is already familiar with certain of the ideas with which they are dealing. Essentially, however, the relation of writer and reader is this: the writer has in his mind certain conceptions, whether they concern facts, concrete mental images, or abstract ideas, which the reader is not in possession of; it is his task to transmit these conceptions as accurately as possible. The writer is manifestly better situated than is the reader, for after he has completed his paper, he possesses not only the written expression of the ideas which he gives the reader - his manuscript - but he has also the original ideas as they exist in his mind; whereas the reader must reach the mind of the writer solely through the imperfect medium of the author's manuscript. Herein lies the writer's difficulty; he reads his paper over before giving it to the reader and unconsciously corrects from the fullness of his own knowledge those gaps and inaccuracies in expression which cause the reader to scratch his head and ask, "Now what does he mean?" In other words, the writer is handicapped by his very knowledge of his subject; he cannot understand why what is perfectly clear to him in his paper should not also be perfectly clear to his reader.

It should, accordingly, be the aim of the writer to approach as nearly as possible the point of view of his reader. In fact, the more closely the author can identify himself with the reader, the more clearly will he write. Very careful writers usually submit their manuscripts to friends or to paid readers before sending them to the publishers, because they realize that expressions which seem intelligible to them may not seem so at all to others. This method of testing out the clearness of what has been written is not, of course, always practicable; too often the only reader is the one for whom the paper is intended. But within certain limits the writer can be his own preliminary reader. This he can accomplish by training himself to take a mercilessly critical attitude toward his writing. He cannot make any expression absolutely fool-proof, but with care he can write so that there is very little danger of his being misunderstood. Such a principle of workmanship often means rewriting and painstaking correction; but this much care is due the reader. If Huxley, a master of prose style, could afford to rewrite one of his lectures seven times, writers less skilled can hardly afford to impose upon their readers hasty, unrevised compositions of any sort. One very practical means which the writer may adopt of disconnecting himself from his original thoughts and thereby of approaching the point of view of his reader is that of putting his composition aside for a period of time until what he intended to say has become less fresh in his mind; then he will be better able to judge of the clearness of what he actually has said and to correct his sins of omission and of commission. This process is, of course, not always possible; wherever it is done, however, it never fails to result in a clearer piece of writing.

There is one specific part of this problem of identifying oneself with the reader which needs especial emphasis. The writer must be very careful to use language which the reader will understand. Any technical writer, whether he be engineer, lawyer, or physician, is likely, often without realizing it, to use a professional jargon which only the initiated can understand. The engineer should remember that he is not always writing for engineers. When he is composing a report for his superior, or when he is addressing an engineering society, he will naturally make use of the technical language of his profession; when, however, he is writing a general report for a committee of capitalists, or when he is addressing a city council, he must use a language which they will understand. Many professional men take a very natural pride in appearing learned in their profession; the most successful professional men, however, recognize the fact that simplicity of language and phrasing is more to be desired than a glossing of technical expressions. Huxley could, before an audience of his scientific associates, make free use of scientific words and details which would drive the average university graduate to desperation; he could, on the other hand, make the most difficult and abstract scientific matters perfectly clear to an audience of London laboring men simply by keeping constantly in mind the limits of their scientific attainments and by meeting them on the ground of common experience.

The extent to which language and manner of presentation should be adapted to the reader must, of course, be pre-determined in every case. A report addressed to a veteran engineer will obviously be different from the same report addressed to a business man. For that uncertain individual, the general reader, it is safest to avoid technical expressions as much as possible; the reader can forgive the writer who is occasionally too simple in his explanation but he cannot forgive the writer who is unintelligible.

To avoid technical language and to write simply is not in the least to lower one's professional dignity. In fact, to be able to make a technical matter clear to a man who has no knowledge of one's profession requires skill of a very high order. The writer who can do this successfully has no difficulty in being technical enough when occasion demands it.

FOREST EXPERIMENT STATIONS

Washington

Clapp and Shepard attended the Denver conference, Shepard going from it to the Laboratory where he remained the balance of the month. Sudworth made a trip through the southern States and returned to Washington during the middle of the month with the news of a possible new species, or variety, of shortleaf pine to add to our troubles. He also found some possible new hardwood species.

The work in the Section of Forest Measurements during the month was chiefly upon the volume tables of the southern pines with some additional work on the western yellow pine volume table study. Vacancies in the section have not yet been filled and probably will not be until after the first of December, when an eligible list becomes available. Bruce returns to the Service on December 1.

In the Tabulating Section a large part of the work has been upon the Northeastern fire study, several thousand fires being analyzed very completely from the standpoint of location, source, area, damage, etc. Additional work was done on the Douglas fir and spruce yield studies. Bruce attended the annual meeting of the Appalachian Logging Congress where he gave a paper as the initial public effort of a drive against the continued use of inadequate log rules. The paper has been published in several trade journals and has been commented upon editorially. With this paper as a beginning, it is hoped that in the course of the next decade we shall be able to convert the lumber industry into measuring their products with a yardstick 36 inches long instead of continuing, as they have done up to the present time, to use a number of yardsticks none of which are correct.

Tentative plans have been made for details in Washington this winter; McArdle of the Pacific Northwest, who will bring with him the Douglas fir yield study for analysis on the tabulating machine; McCarthy, of the Appalachian Station, who will later bring in his oak yield data. Other details not yet worked out include also the possibility of Meyer from the Northeastern, Show from District 5, and Demmon from the Southern States.

From the work which now looms up, it is quite evident that the Tabulating Division will be exceedingly busy on volume, growth and yield, and fire studies, although something from nearly every other group of projects will be put upon the cards for analysis.

In connection with the report to the Bureau of the Budget, the following division of work for the fiscal year 1925 shows, for the principal lines of activity of the experiment stations, the funds expended upon the various lines of work:

<u>Project</u>	<u>Cost</u>	
	<u>F. Y. 1925</u>	<u>F. Y. 1924</u>
Management	\$54,346.74	\$54,000
Forestation	15,044.51	10,800
Types	5,368.07	13,000
Measurements	55,145.56	21,000
Influences	2,123.97	2,500
Protection	43,985.45	32,000
Economics	4,000.00	--
Dendrology	4,300.00	5,600
Extension	4,500.00	3,600
Special	13,205.70	3,700
Total.....	\$202,020.00	\$146,200

Library

Last month there were 773 loans of books and periodicals from the library, and 99 members of the Service and others consulted the library in person.

The librarian indexed 239 books and articles for the card catalogue during the month.

Clear, Effective Writing

I have borrowed a phrase from Mr. H. A. Watt, who gives us our "Foreword" this month. For this month at least, and perhaps for as long as these contributions to the Report continue, let us adopt the above title and drop the rather gloomy-sounding "Editor's Office." If all that is said here contributes to the realization of "clear, effective writing," surely no better title for this section of the Report could be selected.

The editor is making a painstaking study of this month's "Foreword," and would recommend the same study to all writers of Research reports. Mr. Pack's latest boast is that only the American Tree Association is presenting the truth about forestry to the public in language that it will read and understand. It will not avail to cast off that aspersion with the thought that "it is up to PR" to translate forestry to the general public. A goodly portion of the general public wants to know the results of forestry research. It writes in to us for information, and not all of this public is in the same class with the man who wrote to the Department the other day for postum seed. We prepare our bulletins and circulars as convenient means for answering such questions. We prepare our bulletins and circulars as high-grade propaganda. At the least, and farthest from ordinary publicity material, we prepare them to instruct and assist forest school students, rangers, timber owners, stockmen, mill owners, practical woodsmen and nurserymen. The Forest Service has little opportunity to devote time and funds to studies that are not immediately practical to practical foresters. If we are going to sell Federal forest research to a negligent world, every report prepared for publication must be built for its readers, rather than for the author's personal satisfaction or the delectation of fellow scientists. It seems to me that the phrase borrowed from Mr. Watt expresses very definitely the goal of our Research publications.

The final paragraph of the Foreword might well be framed and hung over every scientific writer's desk.

Preparing Tables

The construction of tables, as an integral part of clear, effective writing, was discussed briefly last month, with the promise of later discussion of "illustrative tables." The illustrative tables will be left for another month; but a word on the physical preparation of tables can be contributed here.

1. If possible, double-space all tables, just as you double-space text.
2. Use no horizontal rules, except in the heading. To separate sections of one table, use triple or two double-line spaces.
3. It is well to rule table headings completely, either with pencil after the heading is typed, or with the customary underscore and colon.
4. Vertical rules in the body of the table will be penciled in before the manuscript goes to the printer. Whether the editor does this or you do it does not greatly matter.

I have before me a single-spaced table with every entry ruled horizontally. This is an utter nuisance, to both editor and printer - although the author doubtless intended it to indicate especial care in preparation. Here, at the left, is a section of this table as it appears in the manuscript, and, at the right, an illustration of how it should have been prepared:

: Seed released :		
Test : by air-drying :		
: Number : Number ² :		
No. 1 :	ex- :	ger- :
: tracted: minable:		
1 :	0 :	0 :
2 :	1,560 :	785 :
3 :	3,273 :	2,042 :
4 :	5,103 :	2,909 :
5 :	2,756 :	1,648 :
Aver- : 2,538 : 1,477 :		

: Seed released :		
Test : by air-drying :		
: Number : Number ² :		
No. 1 :	Ex- :	Ger- :
: tracted: minable ² :		
	No.	No.
1	0	0
2	1,560	785
3	3,273	2,042
4	5,103	2,909
5	2,756	1,648
Aver- ages	2,538	1,477

The well-spaced table does not economize paper, but it does show consideration to everyone who must read the manuscript, reviewer, editor, Branch representative, compositor, and proof-reader. The indirect economy in time and tempers saved is large.

DENDROLOGY

Chinese Chestnuts

Through cooperation with the Office of Foreign Seed and Plant Introduction approximately 200 seedlings of Castanopsis delavayi were recently sent to the Appalachian Forest Experiment Station for trial there. This species is a native of mountainous sections of the province of Yunnan, China, and attains a height of 80 feet, and from 2 to 3 feet in diameter. Its growth is rapid but, so far as is now known, not as rapid as that of our native chestnut. The seed from which these seedlings were raised was collected by Dr. J. F. Rock, who has done much exploring in China in search of desirable plants for introduction in this country. It is hoped that this tree proves to be immune to the Chestnut Bark Disease, and suited to southern Appalachians.

The wood of Castanopsis delavayi is somewhat harder and heavier than that of our native chestnut and is suitable for a number of economic purposes for which our better hardwoods are used. Its long, straight, unbranched trunks should afford excellent sawtimber.

Like all species of Castanopsis, this tree is an evergreen, its leaves being thick and leathery. They are exceptional in being densely clothed on the under surfaces with silvery scales (as in species of Elaeagnus); and further, in being toothed on the margin above the middle, in contrast to the leaves of our native Castanopsis, which are uncut on their borders. The filbert-shaped nuts, about one-half an inch broad, have a sweet edible flesh.

During the spring of 1926 a quantity of three-year-old seedlings of the Chinese Chestnut (Castanea mollissima) will be turned over to the Forest Service for trial at the Appalachian Experiment Station and at Letchworth Park, N. Y. A sufficient number of seedlings will be available to plant from one-half to an acre of ground. These seedlings were raised at the Bell, Md., garden from seed collected in the region of Nanking, China, by Prof. J. H. Reisner of the University of Nanking. They have grown thriftily and so far they have given no signs of being attacked by the chestnut bark disease. Castanea mollissima is a large timber tree in China, producing wood comparable in quality with that of our native chestnut.

With considerable hope that this chestnut will resist the bark disease, provisions are being made to plant it in orchard formation, as a means of providing sources of seed for general use.

Activities of the Federal Horticultural Board

On November 16 and 17, one of the most important conferences in the history of the Board's existence was held in Washington at the National Museum. The purpose of the conference was to obtain full expression of the feeling of the various users in this country of narcissus bulbs imported chiefly from France and Holland. The Board's Quarantine No. 37 announced

in 1922 that a period of three years would be given to all American growers for unlimited importation of these bulbs for purposes of propagation. At the end of this period, which terminates on January 1, 1926, no further importations would be permitted. The reason for terminating further importations is that these bulbs are bringing to this country three insect pests, the lesser and greater bulb flies and an eel worm (nematode) which, in the case of the bulb flies also attack onions, and, in the case of the eel worm, it is a pest of alfalfa. The board was fully aware when the three-year period for importation was granted that considerable risk of infestation would be taken. All three of these pests were then known to have gained small footholds on the Pacific Slope. Two things induced the board to take the further risk of increasing the infestation: the horticultural necessity of permitting prospective growers to establish a home supply, and the conviction that by very critical inspection of incoming bulbs the risk of further infestation could be held down to a small margin. European growers also assured the board that the newly devised treatment in hot water they would give the bulbs would effectively free them of insects.

As was anticipated, no attempt was made by the plant commission importers during the three-year period to establish home production plantations in this country. Their enormous importations were used in forcing the bulbs for spring cut flowers, after which the bulbs were discarded - in the majority of cases they were not destroyed. On the other hand, a large number of loyal American nurserymen, particularly in Michigan, Ohio, New Jersey, South and North Carolina, Florida, California, Oregon, and Washington, made use of their importations in establishing home-production plantations. Very large sums of money were invested, totaling several millions. Experienced French and Holland bulb growers were brought to this country in order to avoid otherwise necessary expensive experiments. These efforts soon proved that American growers could produce bulbs equal in quality to the best European bulbs.

In the meantime the approaching end of the importation period stirred plant commission importers, and especially Holland bulb growers, to use every possible means of preventing the quarantine from being put into effect as planned. One of the most powerful agencies aligned with this opposition was the Garden Club of America and its affiliated State organizations. It is regrettable that this club membership was induced to join with questionable and disloyal trade interests in a nation-wide effort to defeat a protective measure of vital interest to American horticulture. However, the underhanded means used to deceive and induce the Garden Club women to join in this unworthy attack fully absolves the members from real blame. They were given and accepted only one side of the story and in their enthusiasm to defend what seemed to them an inalienable right to have plants from Europe without restriction, they did much that had to be undone. During the last year their members promulgated, under false impressions, the purely money interests of disloyal trade people. This great body of women exerted an enormous influence upon the mind of plant growers throughout the

country to the effect that the Federal Horticultural Board was guilty of an attempt to throttle American garden interests. Floral and other horticultural magazines and papers contained cunningly written reminders that this (1925) was the last year in which foreign bulbs could be purchased, letting it be inferred that thereafter the country would be barren of such material. These reminders, from the commission trade people, were obviously for the purpose of increasing sales of bulbs, of which the board's permit records showed had been enormously increased this year, for no other purpose than to meet this overstimulated demand. The board's and the secretary's offices were deluged with protests from all of these sources of opposition. The only satisfying reply to be made to such a concentrated attack was the calling of a public conference at which the people in interest could be heard.

Briefly, the board presented at this conference the actual infestations found in bulb shipments during the last three years, amounting to from 4 to 15 per cent, and noted, as a result, its refusal to allow entrance to such material. The trade interests, in large attendance, presented a volume of protests against the quarantine and denials that any measurable damage had been or could be done by these incoming pests - in fact they "proved" by ignorant gardeners' statements, that no insect pests had ever been found in imported bulbs handled here for over 40 years. It was a case of proving too much. Finally, representative members of the American Bulb Growers Association, a large organization formed during the last three years, presented their case showing, first, the combined large investment of capital in the industry; second, that the best quality of bulbs are produced here; third, that the total production now available will fully meet the country's demand in 1926; fourth, that no bulbs shall be permitted to go out of infested areas, until the pests have been eradicated. A proposed means, already tested, of eradicating these pests is to cease growing bulbs on infested land for a sufficiently long time to insure starving out the insects.

Bulb growing areas in Europe are continuously devoted to the same crop, which is one reason why practically none of the bulbs raised are free from bulb flies and eel worms.

All of the evidence presented at this conference is being brought together in succinct form. Based on a careful review of this evidence the board will make its recommendation to the Secretary as to whether or not the quarantine should go into effect on January 1, 1926.

NORTHEASTERN FOREST EXPERIMENT STATION

All parties have returned from the field and, with the assistance of four computing clerks, field data are being shaped rapidly into recognizable form. The first seminar meeting of the season was devoted to a discussion of plans for the winter's work, in addition to lining up roughly the project work to be undertaken the coming field season.

Dana spoke at a meeting of Massachusetts state firewardens and district rangers and at the annual meeting of the Empire State Forest Products Association. Preliminary results of the fire weather study were presented and received with keen interest at both meetings. Visits were made to the State Forester of Maine, who has compiled the fire records for that State so that they are in shape for punching and tabulating in this office, and has promised to contribute financially to the support of the work; and to the State Forester of New Hampshire, who is becoming increasingly interested in the fire record and fire weather studies, and will probably cooperate with us in their development.

Preparatory to transferring the New Hampshire forest fires since 1915 to punch cards, a separate code memorandum for these fires will be prepared. It is unfortunate that there is not a uniform forest fire report form for all the States, since this lack of uniformity involves an immense amount of extra work, not only in coding but also in working up the results.

The transfer of the 1924 forest fires of Massachusetts to the punch cards is now practically completed. The meteorological data collected during the past field season in connection with the study of weather conditions and forest fire hazard was also transferred to punch cards, in order to facilitate the analysis of these data, and the cards were then forwarded to Washington for sorting and tabulation.

Stickel has undertaken a laboratory experiment to determine if it is possible to calibrate all duff hygrometers in one material rather than calibrating each instrument separately in the type of duff for which the hygrometer is to be used in the field. If this should prove feasible, much time will be saved, and the labors and tedious calibration work need not be done in the field, where conditions are not as a rule conducive to the carrying on of such work.

Dana called at the headquarters of the White Mountain National Forest and made a field inspection of some of the experiments being conducted by H. I. Baldwin of the Brown Company. For the past year Baldwin has been spending his entire time on forest research and has started a large number of interesting projects.

Behre returned from field work in connection with his form studies early in the month, and since then he has made considerable progress in the preliminary calculations necessary to prepare the past summer's material for compilation with that of the previous year. Comments on his manuscript, "Form Class Taper Curves and Volume Tables and Their Application" have been received from all members of the Board of Review and the editor, and a start has been made on a revision which it is hoped may pass inspection. A day spent on a comparison of diameter tape and calipers in second growth red and white spruce indicates that the discrepancies are of no practical importance, since measurements with the diameter tape overrun those with calipers only about two-thirds of one per cent of volume.

Spaulding continued his studies of the decay of white pine slash, in cooperation with the Harvard Forest. The area covered was extended as far north as Dublin and Troy, New Hampshire. A total of 65 slash areas have been examined. All the fungi found rotting the slash have been collected, and all those of importance are identified.

Meyer spent the month in working on various phases of the spruce-fir yield study, attempting to clear up a number of the questions which have been hanging fire. Time of development of seedlings was one of these. From an analysis of about 500 spruce and fir seedlings grown in the open it was found that the average number of years for red spruce and balsam to grow the first 4.5 feet was 15 years, while white spruce takes 13.5 years. This growth is somewhat slower than the original estimate. Variation of age with site was extremely indefinite. Competition and shade exert a much more powerful influence than quality of site. On one seedling plot in an old pasture the heights of dominant white spruce seedlings ranged from three to nine feet, and all were practically the same age. This is an example of the wide variability of the age height correlation during the first period of development. In the above averages the standard deviations amounted to approximately 40 per cent of the values.

Since his return from the field, Westveld has been getting his material in connection with the study of increment on cut-over spruce lands into shape to be transferred to punch cards. His data on the reproduction study of cut-over lands in the mixed spruce-hardwood type have already been entered on punch cards and are being sent to Washington for tabulation. Part of the month he has devoted to analyzing data on logging damage, with special reference to the extent of damage to advance reproduction and young growing stock.

SOUTHWESTERN FOREST EXPERIMENT STATION

Field work has been brought to a close for the year and winter quarters have been established in Flagstaff. Krauch alone prefers the arctic atmosphere of Fort Valley to the steam heat comfort of the town office.

The first measurement of a 160-acre sample plot was finally completed between snowstorms. This area was logged in 1924 and adjoins a plot which is being left in the virgin state.

Several areas suitable for new thinning plots were tentatively selected. To find fully stocked plots adapted to both yield and thinning studies is no easy task in this region. It is very rarely that more than one-tenth acre can be found in one block. Practically the only stands suitable for this work at the present time are pole thickets of the forty-year-age class. There are, however, younger thickets about ten years old which should be large enough for thinnings in from five to ten years. It is the purpose to select a number of typical plots in these stands for future operations. By cutting out scattering old individuals at the present time, it

will be possible to obtain blocks of uniform age and stocking as large as one acre. Such plots can later be subdivided for comparing different degrees and methods of thinning. Although many years are required to obtain results from such young stands, they will furnish the ultimate answer to our problems of early management. Stands forty years or older have already suffered from local overstocking and the presence of undesirable individuals.

We enjoyed a visit from Show November 17-19. Muddy roads and the limited time at his disposal made it necessary to confine our demonstrations to the effects of sheep grazing. After all, perhaps, we have little else to show.

ROCKY MOUNTAIN EXPERIMENT STATION

November Activities

Both at the Station and in the office, the records of the station forest (M-1) was the largest item of activity.

Roeser completed, after review by the Editor, the manuscript on "The Importance of Seed Source and the Possibilities of Forest Tree Breeding" and this has been submitted to the editor of the Journal of Forestry.

At the Station the going projects for the winter are a new artificial lighting test (T-8) and a large-scale, water-use test (T-7), both of which have required a good deal of attention while getting under way.

Bates completed the nth revision of his lodgepole pine seed bulletin. He also completed a review of the transpiration data for 1924-5 and a revision of the figures secured in earlier tests, as a routine progress report. The combined figures given in last month's report, from estimate, are appreciably in error in some instances and should read, in the order there given, 982, 810, 586, 727, 517, 529, and 441.

In addition, Bates prepared a paper for presentation at Kansas City on a special phase of the 1924 tests, the growth of young seedlings in fully-stocked stands. The sum and substance of the deductions are that carbohydrate production is entirely independent of age but very much affected by soil quality. The usual form of growth curves on age is due to understocking of very young stands and to the fact that as the trees reach a certain degree of crowding little of the production goes into new branches. A stand of 55 million lodgepoles in the first year from seed produced at the rate of 4725 pounds per acre or about 157 cubic feet if the production had all been in the form of wood. Little more water was required than is usually available in lodgepole forests.

The Station staff, in collaboration principally with Planting Assistant Schrader of the Monument Nursery, placed an exhibit at the Colorado Pure Seed Show during the week November 16-21. It was designed to be appropriate to the nature of the show and to illustrate steps in reforestation from the cone to the transplant stage. Cones, raw seed, cleaned seed, seedlings just breaking through the ground, and 2-year-old trees, each for 7 species, were shown. It surprises one to observe how foreign to the average person's knowledge are all such facts about coniferous trees.

December Plans

Most of the month will probably be used to review projects and whip the investigative program into shape.

PACIFIC NORTHWEST FOREST EXPERIMENT STATION

All members of the Station have been in the office most of the month, and a good start made on the winter's program. There have ^{been} lately two particularly interesting cooperative contacts with outside forest agencies, which are evidences of the progress that forestry practice has really begun to make in this region.

The three Long-Bell Lumber Co. foresters made a trip with Mr. Kummel of the District Office and the Director up to Wind River, primarily to study the details of nursery management, for that company is just starting its nursery. All phases of forest management for that operation were also discussed.

The research department of the Western Forestry and Conservation Association has been making an extensive survey of 400,000 acres of logged-off land in two counties in western Washington primarily to determine the possibilities for large-scale permanent forest management by a group of owners. McArdle spent three days in the field with Messrs. E. T. Allen and Jacobson, conferring particularly about the yield possibilities of the land.

Westveld came in to Portland November 9 after a long season in eastern Oregon. The last few days Munger spent with him studying brush disposal technique on some current and old National Forest sales and also on some very extensive private cuttings. Westveld left again the end of the month to be in on some swamper brush burning on the Crater Forest, which is being tried there experimentally.

Simson came in from the Wind River Branch the first of the month and since then has been engaged in writing several minor reports and memoranda and compiling the season's meteorological record.

Isaac has been in the office on project reports all the month except for the days when the seed catchers in the Douglas fir seed dissemination study had to be examined. It is interesting to note that at this writing seed is still being scattered from both Douglas fir and white fir.

McArdle computed, and directed two computers, and otherwise worked on the Douglas fir volume table and yield table data most of the month. In the revision of the Douglas fir site classification scheme, it was found necessary to provide for fourteen site index classes. The age correction factors for correcting ring counts on stumps and increment borings also were revised so as to be applicable to five broad site classes. Basal areas have been computed for practically all the composite plots of the Douglas fir yield study. McArdle left November 29 for two months in the East, part of which will be vacation with his family and part will be spent in Washington seeing to the punching of the cards for the volume and yield tables and their running through the machine.

Munger attended the annual meeting of the White Pine Blister Rust Conference in Portland.

DISTRICT 5 - CALIFORNIA DISTRICT

The Denver conference occupied Show's time for the first half of November. After the conference Show went to District 3 where he, with Earl Loveridge, analyzed the fire data for the past 15 years on the Cocconino National Forest. The methods developed in District 5 for extracting the meat from the mass of statistical material, proved of value on this forest.

Practically all of Dunning's time has been spent in assembling a large mass of Methods of Cutting remeasurement data.

Data for about 40 temporary yield plots in second growth white fir were put in shape for use by Prof. Schumacher, of the University of California, who is preparing a yield table for this species. To put these tables on a modern basis the volume tables had to be revised. Schumacher has completed revision of the white fir table. New tables were made here for Douglas fir, including some new trees measured last year.

Mr. Sigurd Ehrenborg, a Swedish forester, visited here a few days. Through the courtesy of Mr. Hammatt of the Redwood Association and Supervisor Wulff of the Stanislaus, Mr. Ehrenborg was able to see some of our best redwood, bigtree, and sugar pine timber.

LAKE STATES FOREST EXPERIMENT STATION

No great advance has been made during November. It was rather a month of digging in and attacking the mass of accumulated field data on the several projects.

The completion of one small project can be reported, namely, the study in the method of cutting jack pine on the Minnesota National Forest with the view of increasing the natural reproduction of Norway and white pine. The problem of converting large areas of jack pine into Norway and white pine is a serious one on the National Forest. The conclusion reached, on the basis of the comparatively short field study, may briefly be stated as follows:

(1) If jack pine is to be converted into red and white pine stands, no clear cutting of jack pine is to be made. Clear cutting of stands of this species invariably induces heavy reproduction of jack pine especially when the ground is burned over.

(2) Red and white pine reproduction comes in freely in jack pine stands partially cut over, while jack pine, although represented in the reproduction, decreases in proportion to the density of the stand remaining.

(3) Cutting in jack pine stands that leaves a crown density of .3 to .4 in the remaining stand affords the best conditions for natural reproduction of red and white pine at the expense of jack pine.

(4) Since many of the jack pine stands on the Minnesota are open in character, they should not be cut over, even if merchantable, until reproduction of red and white pine is assured. Further opening of such stands would only increase the amount of jack pine at the expense of the more desirable species.

(5) The results described can be attained if there are sufficient seed trees in the jack pine stands or near-by. There is no lack of seed trees on the Minnesota, so the question of seed trees need not enter into the problem.

A tabulation showing the essential facts in regard to the plots in the aspen-birch type and a table summarizing the data for the jack pine plots established on the Superior National Forest were made and sent to the Forest Supervisor and the District Forester at Denver. These data, preliminary in character, were made immediately available for use of the Forest officers. In the aspen-birch type, the yields per acre in cords have been worked up for this purpose, using the volume tables which are now being used on the Forest in timber sale work, as no new tables have yet been prepared.

Another item of interest, possibly worth reporting, is the advent of a new forest organization in Minnesota; known as the Minnesota Tree Society, not to be confused with the American Tree Association. This organization has as its purpose the promotion of forestry in the State. The Governor is the honorary president and a number of influential men, including the dean of the Department of Agriculture of the University of Minnesota, are vice presidents; while the State Forester, the head of the Forest School and the Director of the Lake States Forest Experiment Station form the technical advisory board.

As in the two previous years, the Experiment Station is conducting during the fall and winter a graduate seminar in forestry. The general topic for discussion this year is slash disposal. The following phases are being taken up:

- (1) The slash disposal problem in its economic, silvicultural, and biotic aspects.
- (2) Slash disposal as affected by utilization.
- (3) Slash disposal as a fire protective measure.
- (4) Slash disposal as a silvicultural measure.
- (5) Slash disposal as related to forest insects.
- (6) Slash disposal as related to forest pathology.
- (7) Slash disposal as affected by the method of logging.
- (8) Methods and cost of slash disposal.
- (9) Slash disposal legislation.

Twenty students are registered for the course.

At least two members of the staff are budding doctors. Kittredge at present is taking courses in chemistry and soils, and Wackerman takes up next quarter organic chemistry and a reading course in plant physiology.

Hadley of the Southern Station paid us a visit for two days, and Garver from the Forest Products Laboratory spent a couple of days with us in connection with the cooperative study on the comparative costs of logging small and large trees,

Addresses:

Raphael Zon: November 2, four talks at the School of Forestry at the University of Idaho before students and the Sigma Ki Chapter; November 5, address before the Rotary Club, Missoula; November 30, address before the Men's Club of St. John's Episcopal Church, Minneapolis.

CLOQUET FOREST EXPERIMENT STATION

The extremely cold weather during the month prevented any outdoor work except logging. Two operations are in progress now. The logging of green timber is going forward rapidly. The stand cut this year is somewhat scattered and this will reduce the profit in the operation.

Already about 300 cords of dead and down tamarack have been cut and await the snow for hauling. This material will be used for firewood and sold from the station woodyard. It should yield some good information on the cost of firewood. Heretofore, firewood has come as a by-product of logging and it has been impossible to figure accurately the cost.

Negotiations are under way for hauling the winter's cut as a demonstration. The local Ford agency is interested in demonstrating the value of the Fordson tractor in this work and is willing to cooperate. It is hoped that satisfactory arrangements can be made. Tractor logging and hauling is not an entirely new proposition in this section but more information is needed.

The station office is being closed and headquarters will be transferred to the University Farm at St. Paul.

The annual report was completed during the past month.

SOUTHERN FOREST EXPERIMENT STATION

General

The first of this month found most of the technical members in the office.

Forbes called a staff meeting of all members at headquarters, at which Hadley gave an interesting talk on his trips to Madison and the Lake States Station. Forbes addressed the Louisiana Engineering Society at its monthly meeting, on "What We Don't Know About Our Southern Trees," with lantern slides.

Dr. G. B. Sudworth spent a day at Bogalusa with Forbes, Wakeley, and Barron. They went into the Pearl River bottoms and swamps to identify trees and the members who accompanied Dr. Sudworth declare their day was well spent.

We were able to help Mr. B. H. Paul of the Laboratory in selecting suitable locations for the Laboratory's study of growth conditions of southern pines. In connection with this study Mr. Paul visited Bogalusa and Starke.

Other visitors at the Station were the following: A. C. Carpenter, Arthur D. Little, Inc., S. C. Sweeney, West Virginia Pulp and Paper Company, who also visited Bogalusa; Mr. Davies of A. C. Tuxbury Lumber Company, Charleston, S. C., and Mr. Pettyman of Summerville, S. C., who were interested in turpentine leases; E. M. Davies of the Laboratory; and J.E. Guardia, State Normal College, Natchitoches, La., who sought information on the forest conditions of Louisiana.

Protection

Fire. Demmon, Shivery, and Hicks, with the help of Louisiana State Forester W. R. Hine, made remeasurements on the Roberts' Plots at Urania.

Grazing. Hadley wrote two short articles on the grazing study at McNeill, based on his report of establishment of this project. One article was sent to the lumber trade journals and the other is to go to a technical publication.

Measurements

Forbes spent several days on the text and tables for his bulletin on the rate of growth of second-growth pine.

Management

Shivery spent the better part of the month on computations and text for his report of the establishment and natural reproduction study at Bogalusa. This awaits review by the Director.

Demmon worked up the fire damage data taken on the extensive surveys in Arkansas, Mississippi, Louisiana, and Texas, and Hicks worked up basal areas for the cores collected. Barron came to headquarters for a week's office work on these surveys.

Two crews spent the last two weeks making strip surveys. One crew, composed of Hadley and Henry, later joined by Forbes, was on the Florida National Forest. The other, made up of Demmon, Hicks, and Shivery were in Louisiana. Our crews have been receiving the fullest cooperation, both from other units of the Service and private lumber companies.

Demmon, Shivery, and Hicks established a permanent plot in the Greeley Pasture, Urania, La., for determining annual seed production of loblolly, longleaf, and shortleaf pines. This plot was established in an area where the three species were closely associated.

Naval Stores

Wyman, with the aid of Henry, seraped all trees on the naval stores tracts. In the light of comments from the Washington Office he revised his article for the Southern Lumber Journal on "Florida's Naval Stores." Wyman came to New Orleans the middle of the month and with the assistance of two clerks was able to accomplish a good deal on the computations for his annual reports.

Forestation

Hadley feels that his knowledge of forestation work in general has increased materially through the cooperation extended him while at the Laboratory and the Lake States Station.

On his return from several days' annual leave Hadley visited the Georgia Forest School and discussed with Professor Burleigh plans for future seed testing work at Athens.

During the month Hadley transmitted to Washington his comments on F. W. Haasis' "Forest Plantations at Biltmore, N. C." Wakeley and Barron measured and counted several hundred cones for the germination tests. They also put in the fall plantings and find that the loblolly and short-leaf is moderately infested with *Toumeyella* scale.

NORTHERN ROCKY MOUNTAIN FOREST EXPERIMENT STATION

One of the accomplishments late in the field season this fall was a soil survey of the demonstration forest at the Priest River Branch. Mr. Lapham and Mr. Youngs of the Bureau of Soils spent two weeks on the job assisted by one man from the station. The map and report were finished on the ground. The full 4,030 acres were covered by the survey, but as so much of the slope land in the forest proved to be uniformly sandy loam, a large part of this was not covered intensively. Briefly it may be stated that over 90 per cent of the area is sandy loam of one type or another, and that three-quarters of the area is of one type of soil designated Huckleberry fine sandy loam. Some of the flats and benches are clay. Naturally the surface soils of the majority of the soil types are remarkably similar in physical characteristics, and the Bureau men believe they are also much alike in chemical composition. The soil materials of all types are derived from granitic and schistose rocks. Practically all the soils contain considerable mica. They are also almost uniformly acid.

In addition to physical characteristics, soil separations were also made on the basis of the character of the subsoil, the moisture-holding capacity and the drainage. A natural question is whether the differences in physical and chemical characteristics of the soil on the demonstration forest show any influence in determining the growth and species found on the different soil types. The answer of both the Bureau and the Station

men is that there appears to be no such influence and that differences in forest composition and growth are apparently due to differences in available soil moisture, which is governed in turn by such factors as moisture-holding capacity of the soil, by slope, exposure and drainage. This Station is at the very beginning of its speculations on the relationship of soils and the forest crop, and would be very glad to benefit by counsel from the Stations which have made a start in soil studies.

During the first half of November Weidman and Kempff spent considerable time visiting a number of active timber sales within striking distance of the Priest River Branch. The purpose was to locate suitable conditions on areas now being cut or to be cut this winter, upon which to establish permanent sample plots in methods-of-cutting. At the same time stands of young age classes were also looked up for yield and other purposes. Altogether a dozen going timber sales were reconnoitered. Previous to this the timber sales in the proposed Coeur d'Alene center were visited for the same purpose. Satisfactory conditions for 12 sample plots were found in the two experimental centers. It is planned to put a crew in the field to establish these plots next field season.

While Weidman was on the Kaniksu Forest he spent three days with the Forest Supervisor inspecting a number of timber sales chiefly in connection with reproduction, marking, and slash disposal. A day was spent in conference with Mr. Wyckoff and his staff in the Western office of Blister Rust Control in Spokane, to coordinate the work between the two organizations where possible in the future. To this end Mr. Wyckoff will attend the District Investigative Committee meeting this year. Weidman and Gisborne spent two days in conference at the University of Idaho. In connection with the meteorological end of forest fire studies, details of cooperation between the experiment station and Dean Angell of the College of Letters and Science were discussed. Dean Angell has done individual research on the relation of atmospheric electricity to the weather. In connection with silvicultural studies steps were taken with Dean Miller of the School of Forestry looking toward a better coordination of research work conducted by the experiment station and the forest school. The faculty members are employed by the year under an arrangement whereby they spend two months of the summer on forest research. For several years the faculty men have been carrying on investigations in growth and yield on State and private timber holdings in northern Idaho. These studies are somewhat similar to those which have been carried on by the experiment station on National Forest land. It is planned to cooperate a little more closely in these studies in the future.

Except for the trip to the University of Idaho Gisborne spent the entire month on office and laboratory work in Missoula. Much of the time was devoted to revising the manuscript of his fire studies bulletin. Two short articles were prepared for "American Forests and Forest Life." These describe some of the best inventions by Forest officers for use in their

work. As an outcome of a cooperative arrangement with the University of Montana Forest School, Gisborne has been calibrating his 11 duff hygrometers in the new Freas electric oven installed at the university. By the use of this oven, calibration can be done much more accurately and cheaply than by the methods employed in the past.

In the cooperation with Dean Angell of the University of Idaho, the arrangement is for that institution to loan us an especially constructed quadrant electrometer by which we are to take regular measurements of the difference in electric potential between the earth and the atmosphere. This instrument was built under Dean Angell's direction in the instrument shop of his physics laboratory. Specifically it measures the voltage and sign of the electric current flowing between the atmosphere and the earth. Similar measurements have been made by the Carnegie Institute in this country and at Kew Gardens in England. These observations have indicated strongly a relationship between atmospheric electricity and the weather. It is felt that this relationship may be identified with precipitation or possibly relative humidity, and thus give a forewarning of the approach of such a weather condition. The instrument is to be read several times a day and after this has been done a sufficient number of days to accumulate enough measurements a comparison of weather records for the same days will be made to determine the relationship, if any, with the various weather elements in this region. If sufficiently fruitful results are obtained, Dean Angell will construct another instrument and run parallel observations to ours at Moscow, Idaho. The instrument costs close to \$300.00.

Another phase of fire studies proposed to Dean Angell as offering possible problems for his advanced students in physics is that dealing with the fundamental factors of combustion in free-burning forest fuels. Specifically we asked whether he could not investigate the gaseous composition of the air in its relation to the ease of ignition and rate of combustion in this connection. Although he showed considerable interest in the subject and said he would make an effort to have some work started on it, he could not promise that at present because problems for the year had already been assigned to his several advanced students.

Haig returned to Missoula during the first week of November and has since been giving his time to office work on yield, volume tables, and methods-of-cutting.

Wahlenberg reports spending the first half of November in seed sampling, counting, and weighing, and in finishing the laboratory work on trees representing the fall field experiments. Seed tests were started in the greenhouse and a new map of the experimental planting area was drawn. The remainder of the month was devoted to starting the compilation on progress reports of work for the past season. Early in the month Wahlenberg submitted a revision of his article "Western Larch Nursery Practice" and also a memorandum on a possible new phase of survival studies.

During the first part of the month Kempff spent a great deal of time with Weidman in locating suitable conditions for permanent methods-of-cutting plots on a number of active timber sale areas. In addition to this Kempff and Marshall, together with one of the men from the Supervisor's office, later visited another sale for this purpose which had been proposed by the Supervisor. This was a 120-year-old stand, and a sample area was laid out in it to try out several methods of marking and to secure a stand table. The greater part of November was spent by Kempff and Marshall laying out several new permanent sample plots and completing tagging and measurements of plots established earlier in the season. Some time was also given to compilation work, to visitors, and to the supervision of two temporary laborers engaged in station maintenance.

The visitors to the station during November included: Messrs. Manning and Parlow of the British Columbia Forest Service to obtain a general knowledge of the various lines of investigation carried on at the Priest River Branch; Assistant District Forester Wolff; Supervisor Whitham, and Lumberman Dow of the Kaniksu Forest.

APPALACHIAN FOREST EXPERIMENT STATION

General

The executive committee of the Appalachian Forest Research Council has called a meeting of the council to be held at Richmond, Va., January 5, 1926. Richmond was selected because of the unusual opportunity presented by the joint meeting of the American Forestry Association and the Southern Forestry Congress to be held there January 6 and 7. It is also expected that a meeting of the Southern Appalachian Section of the Society of American Foresters will be held at Richmond at some interval between sessions of the other organizations. This combination of meetings promises to be the most important forestry gathering ever held in the South.

As a basis for determining the most satisfactory locations for branch stations Haasis has prepared a brief report and a series of maps outlining the topographic, climatic, soils, and forest characteristics of the region. The branch stations should be located at points representing the distinctive subregional conditions affecting forest composition and growth. In the Southern Appalachians these conditions tend to conform to the general northeast to southwest direction of the topographic divisions except as to climate. Length of the growing season, soils, accessibility, and facilities for investigative work will doubtless be the chief determining factors in the selection of branch station locations.

Dr. F. C. Craighead and R. A. St. George spent a few days at the Bent Creek field laboratory closing the entomological work for the winter. Donald Bruce visited the Station and discussed with Frothingham, McCarthy, and W. J. Damtoft some of the problems met in recent field work.

Frothingham talked before the Asheville Garden Club on "Forest Research in the Southern Appalachian Mountains," and prepared a paper for a special edition of the Asheville Times on "Science to Aid Timber Growing in the Southern Appalachian Region."

Mr. Paul Borger, of the Davey Tree Expert Company, called with a rumor of white pine blister rust near Brevard. The owner had burned the suspected tree. Mr. Borger said he doubted the determination, but the owner had several other suspected trees and he would try to get specimens.

Inflammability of Leaf Litter as Related to Weather - Pf-2

The study of forest litter dryness in relation to weather was continued at Bent Creek by McCarthy. The weather during most of this season

was very unfavorable to fire, and few ~~fire~~ days and few hours when fire would run occurred between October 1 and November 24, when the study was discontinued. No continued dry periods developed. The leaf litter came down late and high humidity with frequent rains prevailed.

The test of three duff hygrometers obtained from the Northern Rocky Mountain Experiment Station indicates that the hardwood leaf litter is too sensitive to air moisture to be subject to the determination of humidity fluctuations by means of the duff hygrometer. Top leaves dry out by curling and free access of air. A duff hygrometer in the top inch of leaf litter becomes merely a recorder of air humidity; while leaves closed about the shaft of the instrument will retain moisture long after the surrounding woods will burn.

On November 12 a rainfall of 2.3 inches ceased at 4:30 p. m. The wind blew in gusts up to about 18 miles per hour during the night and following day. South slopes were quite inflammable by 2 p. m. November 13. Even the layer of old litter beneath the new fall burned. The humidity had only dropped to 28 per cent from 40 per cent at noon, and the temperature did not go above 69°, averaging 50° to 55°. At the end of 40 hours of this condition the leaf litter had reached the crumbling stage (about 8 per cent moisture).

Records of soil temperature at 6 inches, 12 inches, and 18 inches showed the rate of cooling on north exposures to be much more rapid than on south slopes, as would be expected.

Germination and Early Survival of the Oaks - Mr-2

Korstian reports satisfactory progress in this study which he is conducting at New Haven, in cooperation with Yale University.

An experiment to determine the influence of various kinds of substrata on germination was begun during the month. The newly developed oak roots are successfully penetrating moss-covered and sod-covered soils but are, for the most part, utterly unable to penetrate compacted bare soil, running instead along the top of the soil or sometimes pushing the acorns over backwards. The first dry weather kills them. This experiment emphasizes the importance of a leaf litter cover to keep the surface soil mellow.

The influence of temperature on the germination of red, black, scarlet, white, and chestnut oaks is being studied in a series of five constant temperature chambers, having temperatures of 35, 50, 65, 80 and 95 degrees F. Of 5 lots of acorns of each species, one is kept constantly at 35°, the other four at the four higher temperatures during the day but are shifted at night to chambers having temperatures 15 degrees lower. The representatives of the white oak group at the higher temperatures have practically completed germination in 20 days, but the black

oak group have germinated very feebly or not at all, even at the higher temperatures.

To determine what influence, if any, the seed coat has, the shells were removed from 100 red oak and the same number of white oak acorns before they were planted in the greenhouse. Through the courtesy of Director Slate and Dr. E. M. Bailey, Chemist of the Connecticut Agricultural Experiment Station, quantitative chemical analyses of three representative species of each group are being made by the Connecticut Station. These analyses will be further substantiated by a few relatively simple micro-chemical qualitative studies in the laboratory to determine the various stored foods present in the acorns and the presence of the principal enzymes which are capable of converting these into such form that they can be used at once by the young plant when moisture and temperature conditions are favorable to growth. The cooperation of Dr. C. G. Deuber, Instructor in Plant Physiology at Yale, has been secured in this phase of the work.

The remaining studies on moisture and temperature will be started just as soon as the work of making germination counts and other routine record taking slacks up sufficiently.

Practically all of the storage experiments were completed during the month. Acorns were stratified in sand and buried 3 feet under ground on a well drained hillside, stratified in sand and put in cold storage at a temperature a few degrees above the freezing point, packed in a mixture of sifted sphagnum moss and charcoal, with and without being moistened with a saturated (about 0.25 per cent) and a 0.1 per cent solution of salicylic acid, were anchored in a stream of running spring water, and were put up in water glass and in desiccators.

Importance of Forest Grazing - Pa-1

Haasis prepared a memorandum on the importance of forest grazing in the mountain region, basing it upon the replies which have so far been received in response to a questionnaire. In view of the many urgent problems which require attention it is quite likely that a recommendation will be made that this project be absorbed for the time being into the study of natural regeneration after cutting (Mc-2).

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Lake States

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Conversion of Jack Pine into Red and White Pine Stands. R. M. Brown
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